

## ABSTRACT

An improved semiconductor position-sensitive radiation detection device based on a photodiode array formed in a substrate. In one embodiment, the substrate has a first surface and a second surface opposing the first surface. The first surface is electrically conducting to provide a common bias potential to the photodiodes and is optically transparent to receive input photons to be detected. The device includes a grid of conducting wires formed over and in electrical contact with the first surface and configured to define an array of pixels corresponding to the array of photodiodes. A scintillation array of scintillation elements can be coupled to match the pixels defined by the grid of conducting wires and to convert incident radiation at a first wavelength outside the characteristic spectral response range of the substrate into secondary photons at a second wavelength within the spectral response range of the substrate. The scintillation array includes optically reflective surfaces disposed between the scintillation elements to optically isolate one scintillation element from another.

10065015